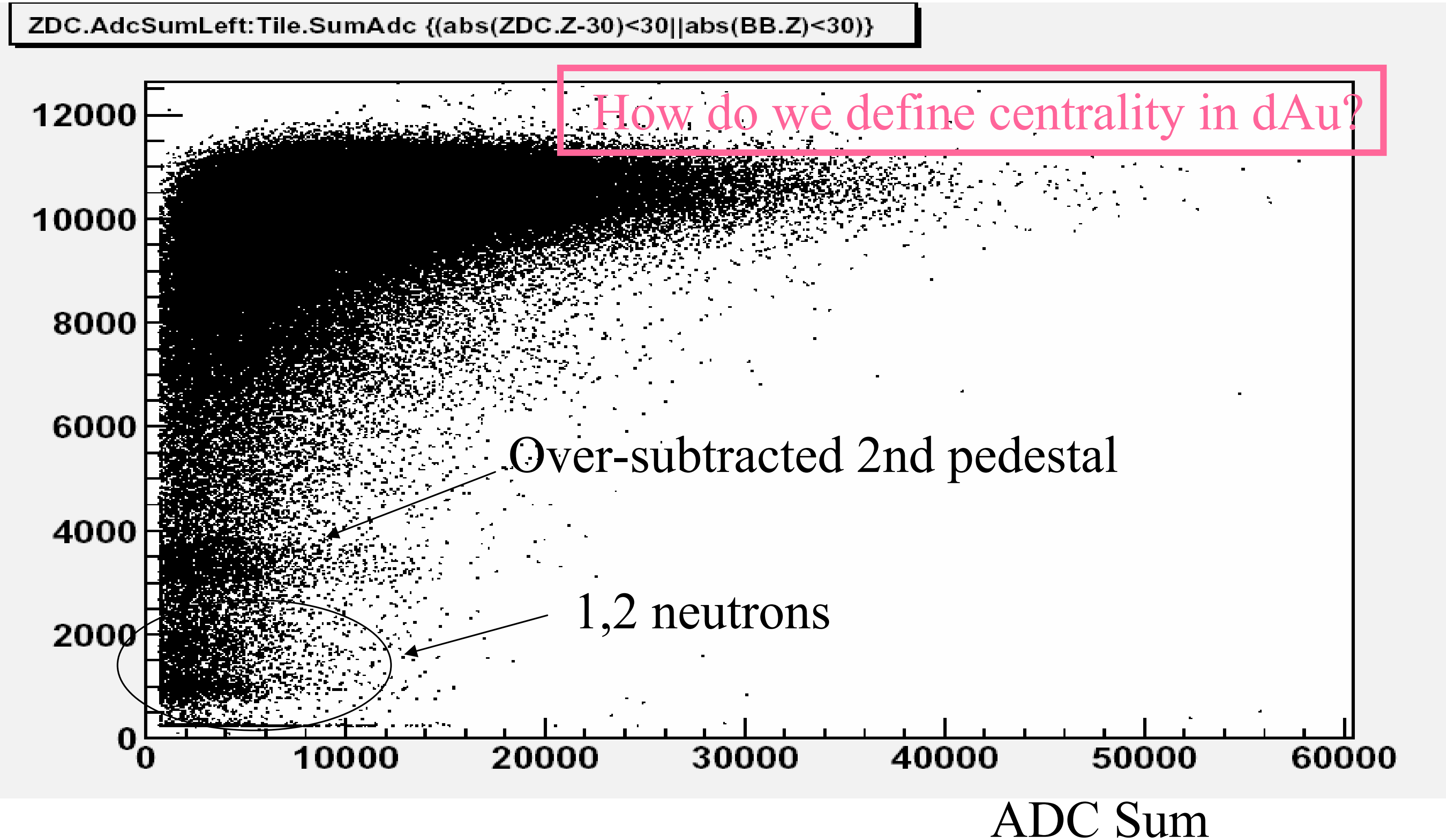
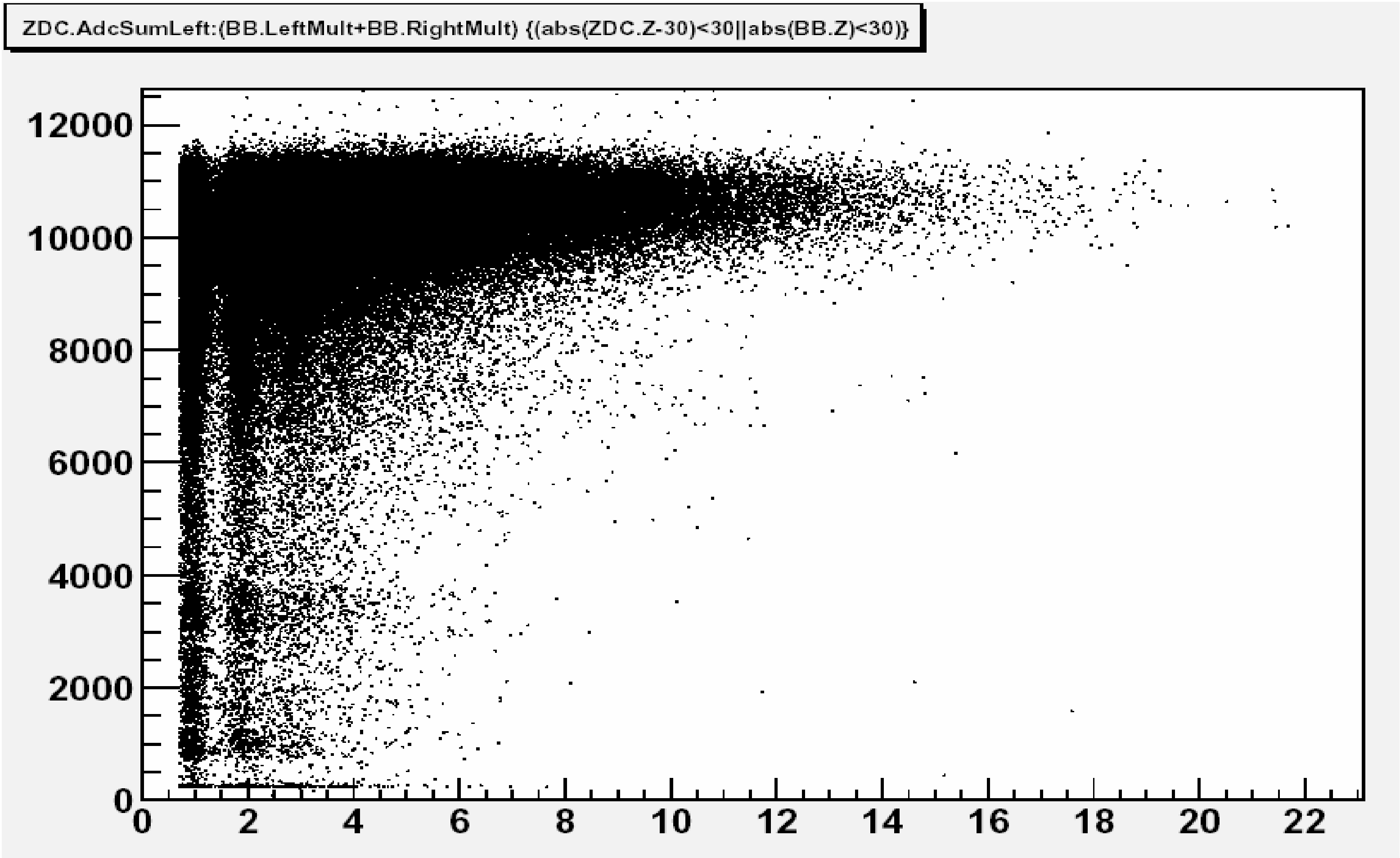
High-pt in BRAHMS (with some of my personal point of view)

- dAu: Some Issues: Cold nuclear effect
- CGC measurements in dAu?
- $y \approx 1$ not not-interesting (physics doesn't have to be the same as at y=0)
- What can we learn from suppression factors in p_L (can this be sensitive to source profile?)
- Proton suppression at y=0: marginal statistics but probably publishable (+40°?: need more clever PID)
- Suppression more sensitive to Npart?: Double cut

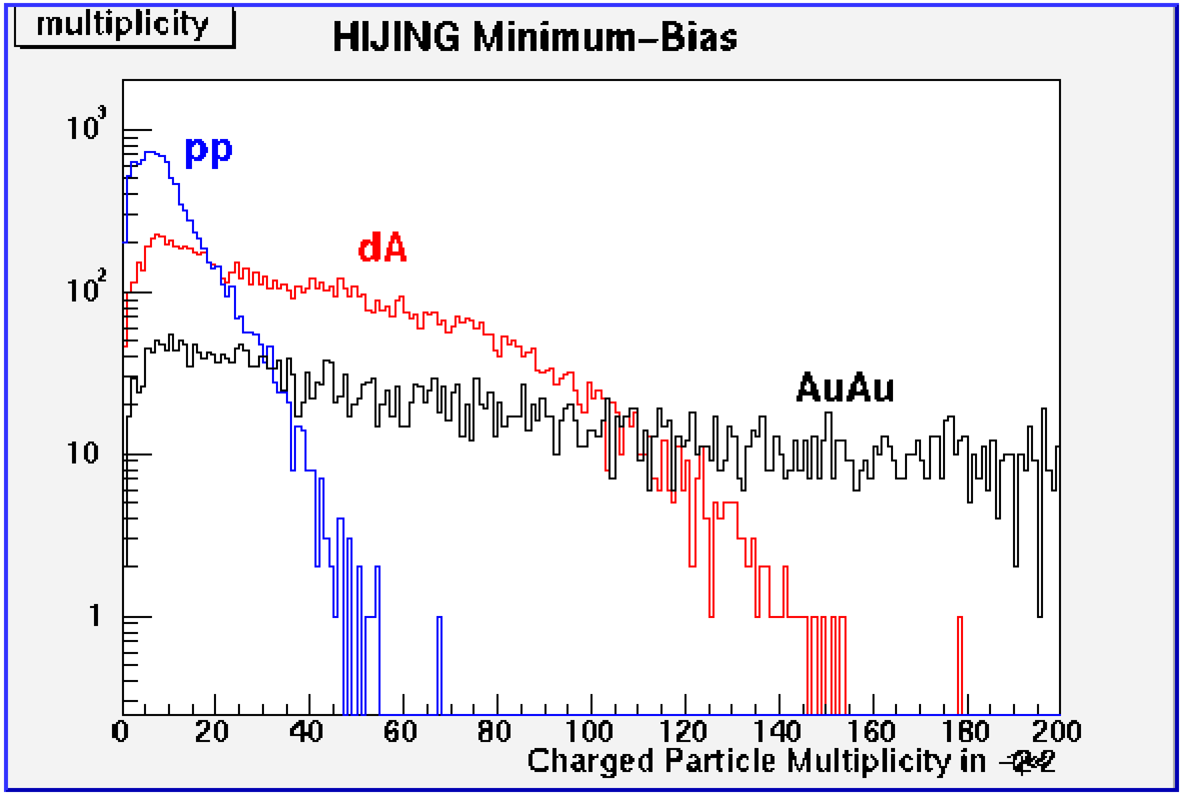
ZDC vs Tile ADC for dAu



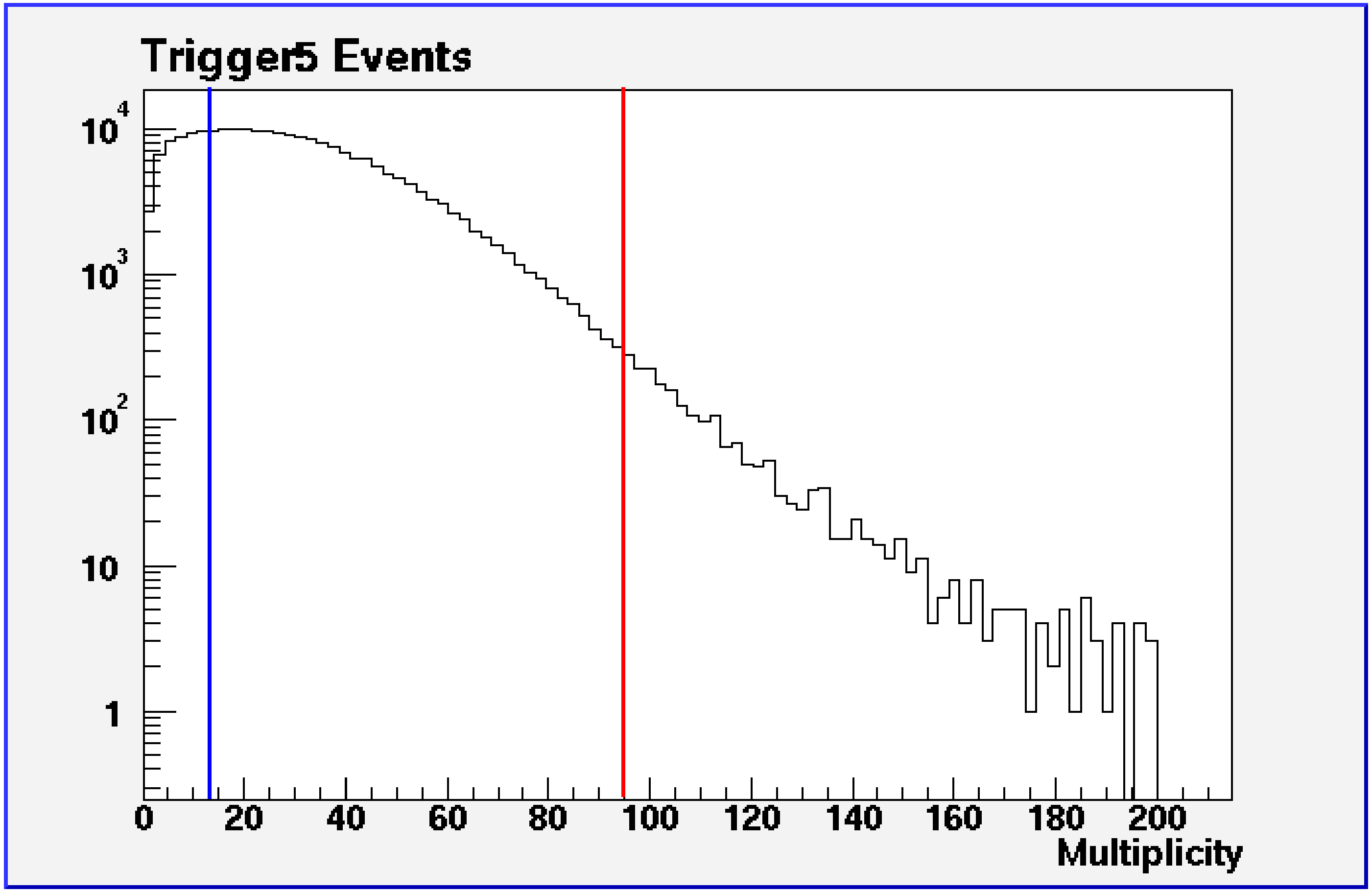
ZDC vs BB


ZDC.AdcSumLeft:(BB.LeftMult+BB.RightMult) {(abs(ZDC.Z-30)<30||abs(BB.Z)<30)}
12000
10000
8000
6000
4000
2000
0
0
2
4
6
8
10
12
14
16
18
20
22

Multiplicity



"Centrality" Cut



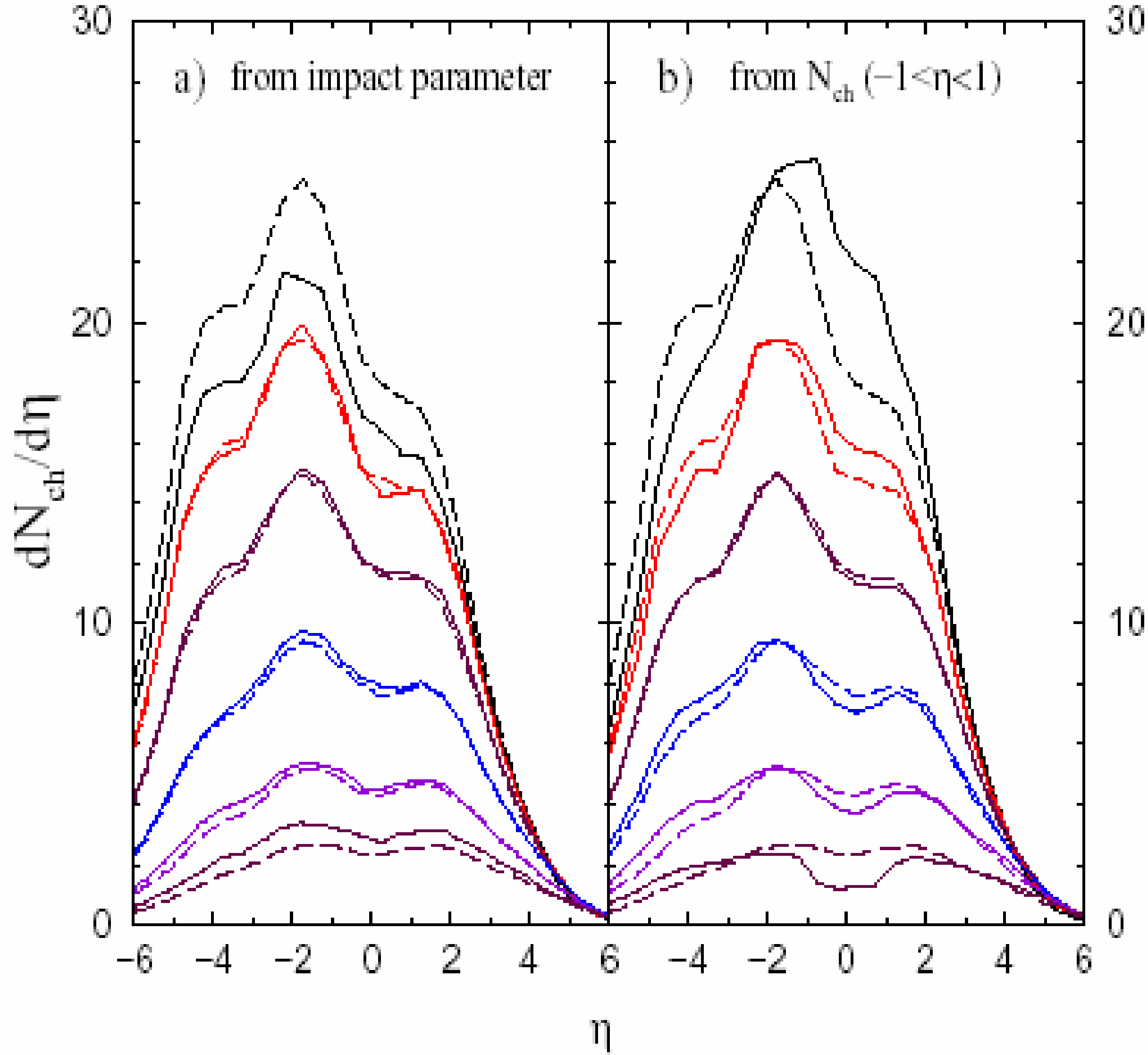
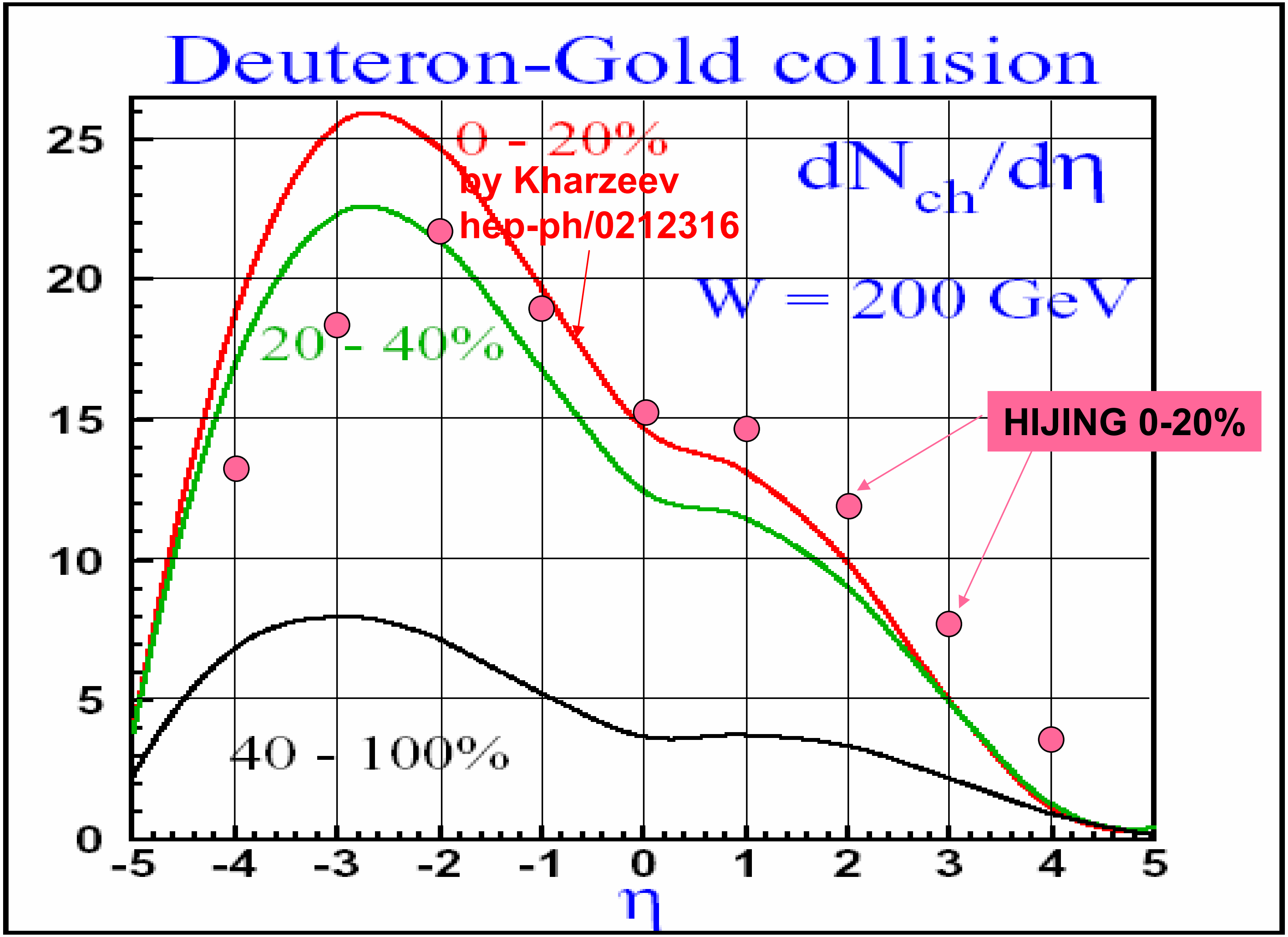
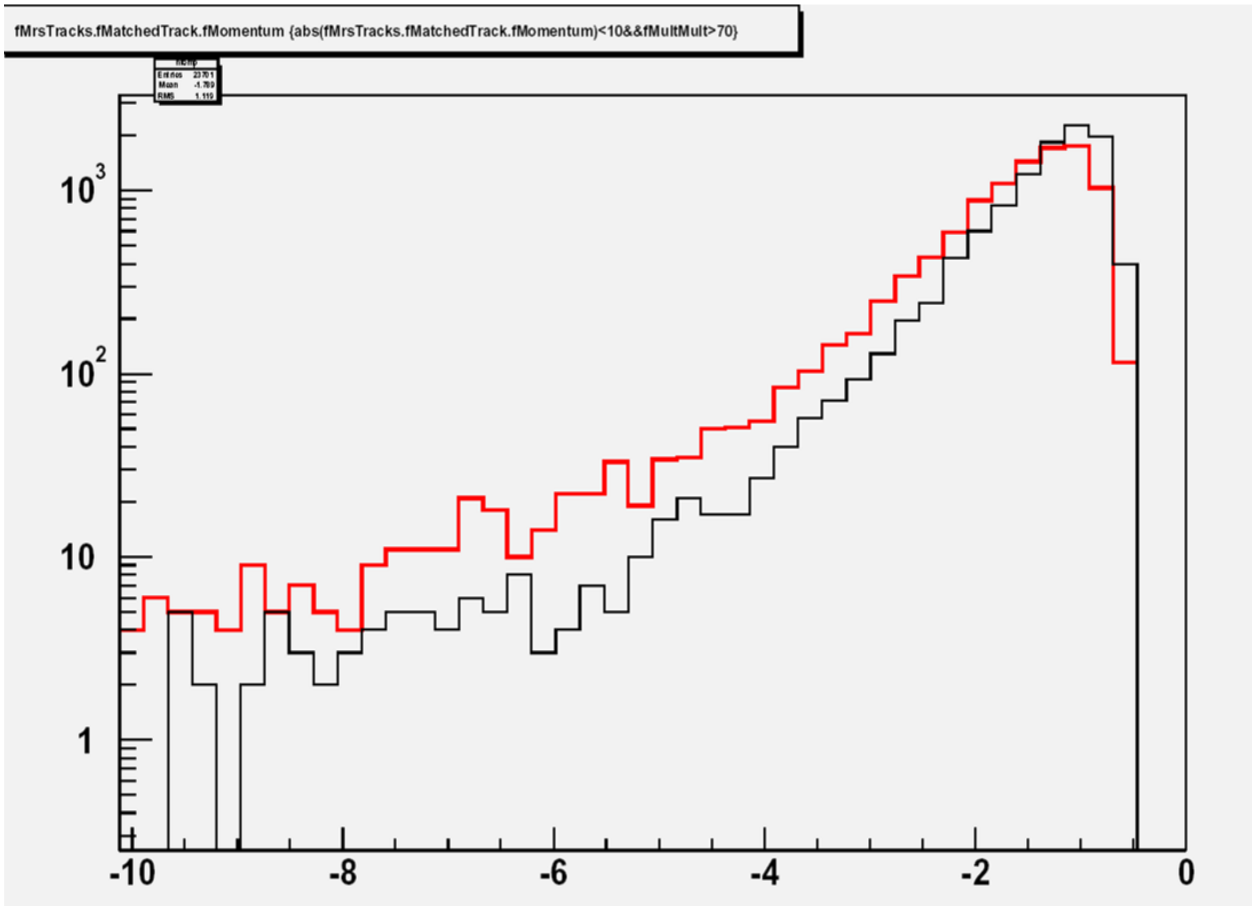


FIG. 8: Charged particle multiplicity distributions at six centrality bins of 0 − 10 − 20 − 40 − 60 − 80 − 100% when the centrality is determined from a) the impact parameter or b) N_{ch} within $-1 < \eta < 1$. Dashed curves represent results when the centrality is determined from N_{part}.

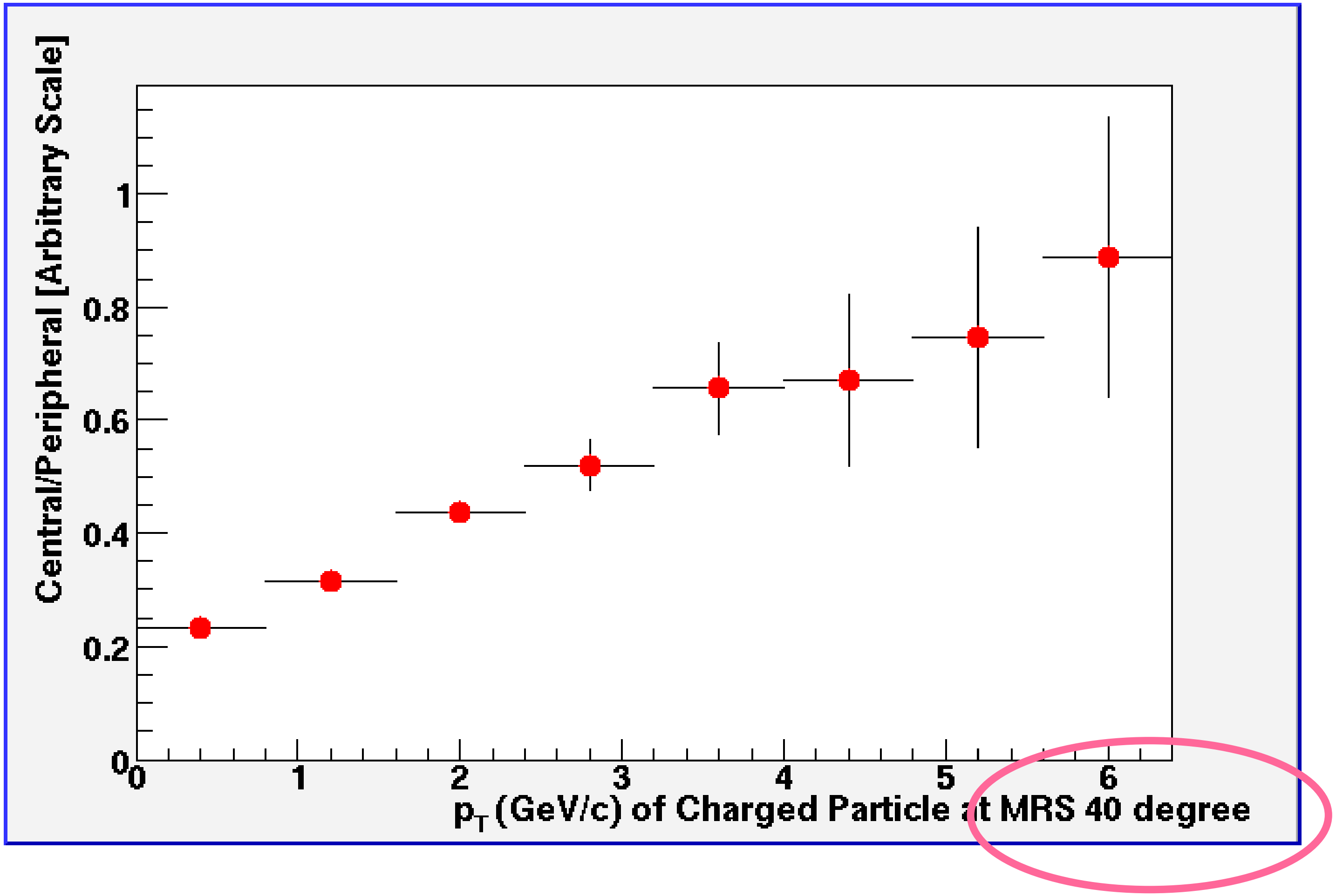

Deuteron-Gold collision
0 - 20%
by Kharzeev
hep-ph/0212316
dN_ch/dη
W = 200 GeV
20 - 40%
HIJING 0-20%
40 - 100%
25
20
15
10
5
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
η

Momentum spectra (“central” / “peripheral” at 40deg.)

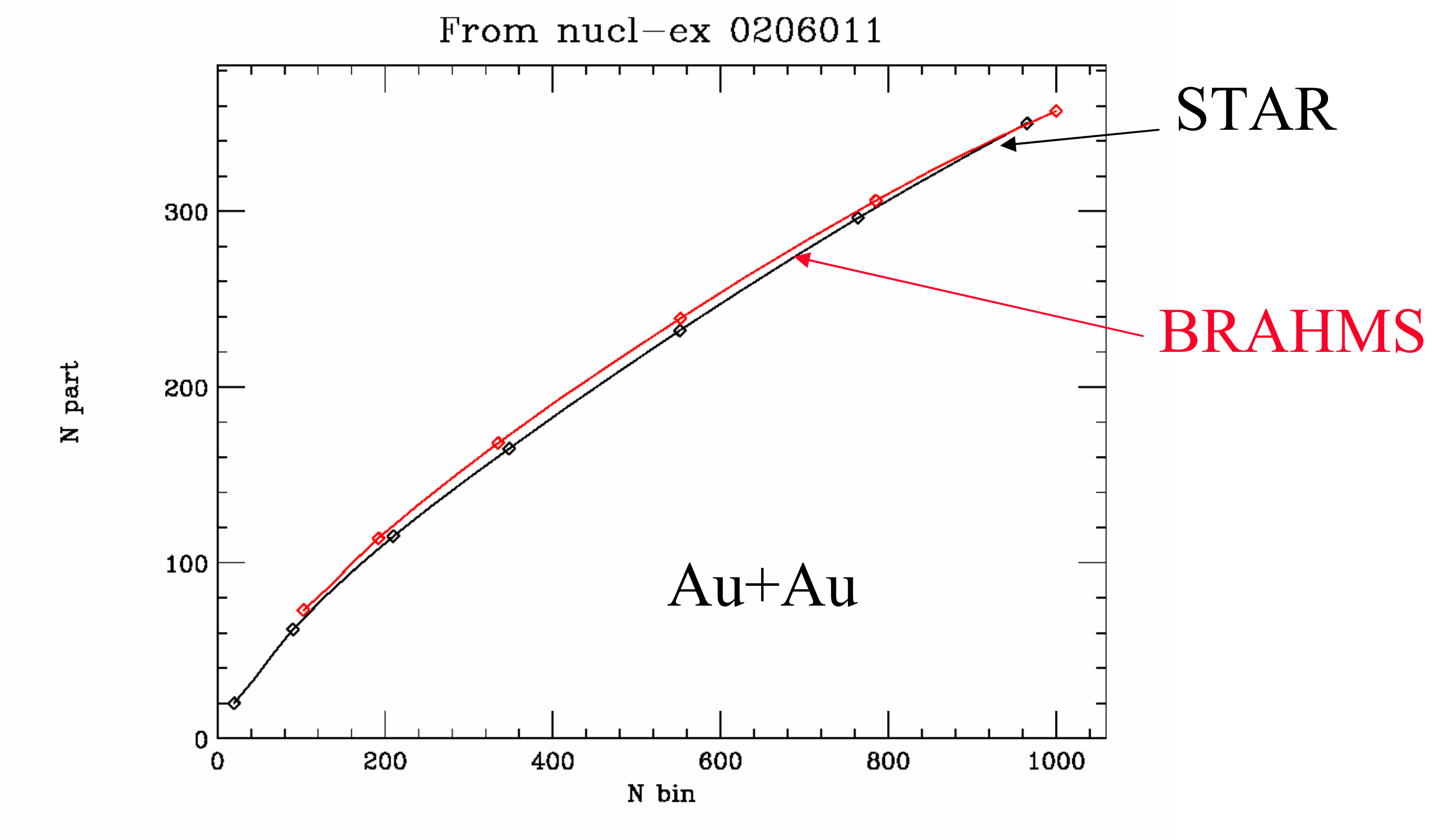


BRAHMS

High-pt "suppression" in dAu?



N_{part} and N_{bin}



- We need a table for d-Au

Resolution of Centrality Cut

Centrality (%)	RMS/<$N_{Track(TPM1)}$>
0-10%	1.7%
10-20%	2.4%
20-30%	2.5%
30-40%	3.4%
40-60%	8.9%
60-80%	9.4%

CGC measurement

- Uncertainty in measurement < uncertainty in calculation (20-30%?)
- Q_s changes as function of rapidity
  - Measure pt vs y: relying less on absolute predictions
  - Checking scale (λ) from HERA
- Measure slope and convexity
- $dN/d\eta$

Although the figure does not provide a quantitative prediction for experiments at RHIC, one should notice non-trivial features. It is predicted that when strong-field effects set in around $Q_s^{(2)}$, the $k_\perp$ distribution of secondaries flattens. Not only does the scaling with A_2 differ in the two regimes, as mentioned above, but more importantly the "turnover" point $Q_s^{(2)}(y)$ is a function of rapidity ! Experimentally, one can thus take the rapidity dependence of the saturation momentum from a parametrization of HERA data [19], which also seems to fit the observed rapidity dependence of dN/dy from $Au + Au$ at RHIC [3], and test whether the turnover in the *transverse momentum distribution* from fig. 1 moves as one changes the *rapidity* in a way consistent with those parametrizations. Dumitru, nucl-th/0203035

But: will the shapes survice after converting gluons into hadrons?

Lenagan and Tuominen
hep-ph/0208007

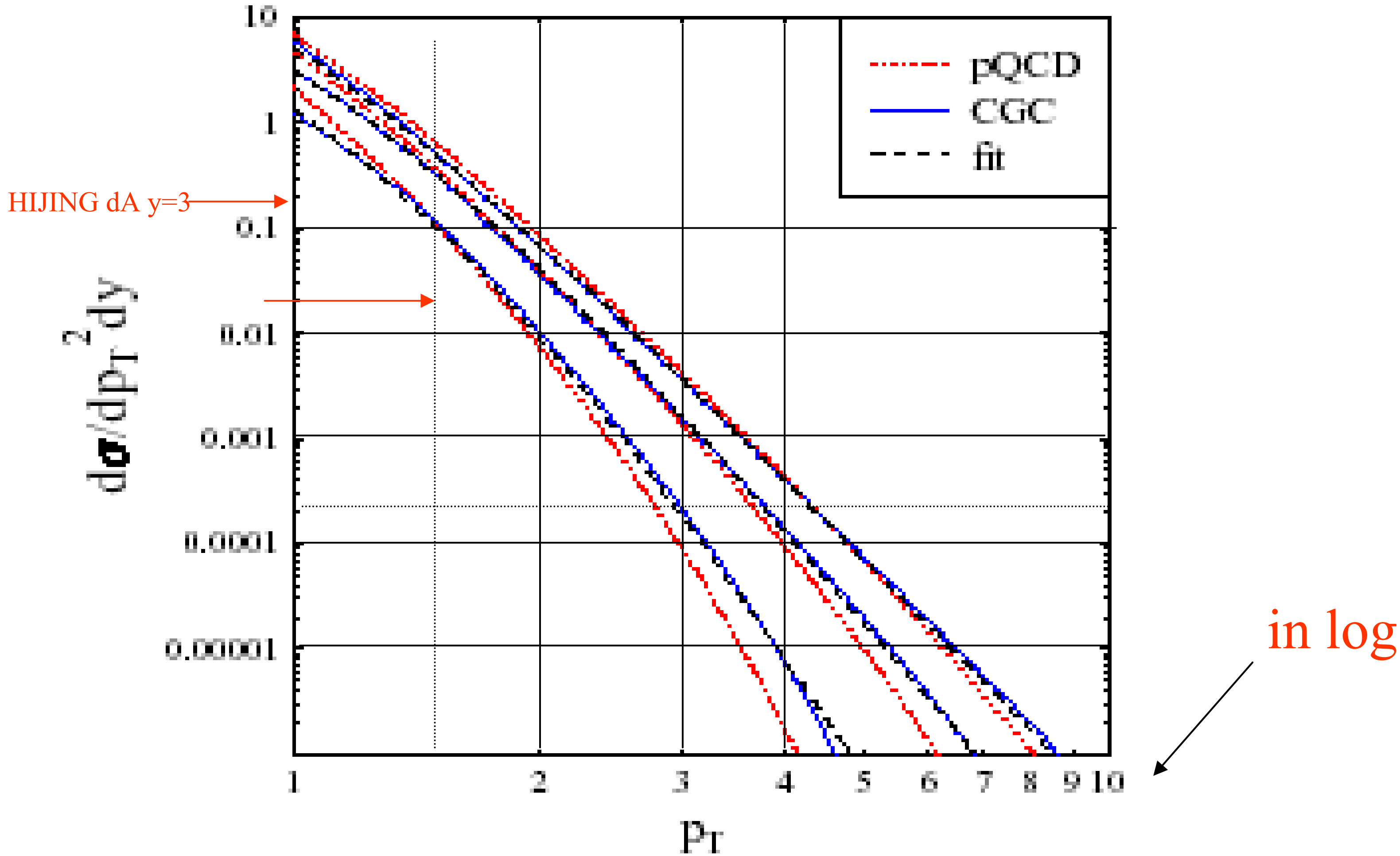
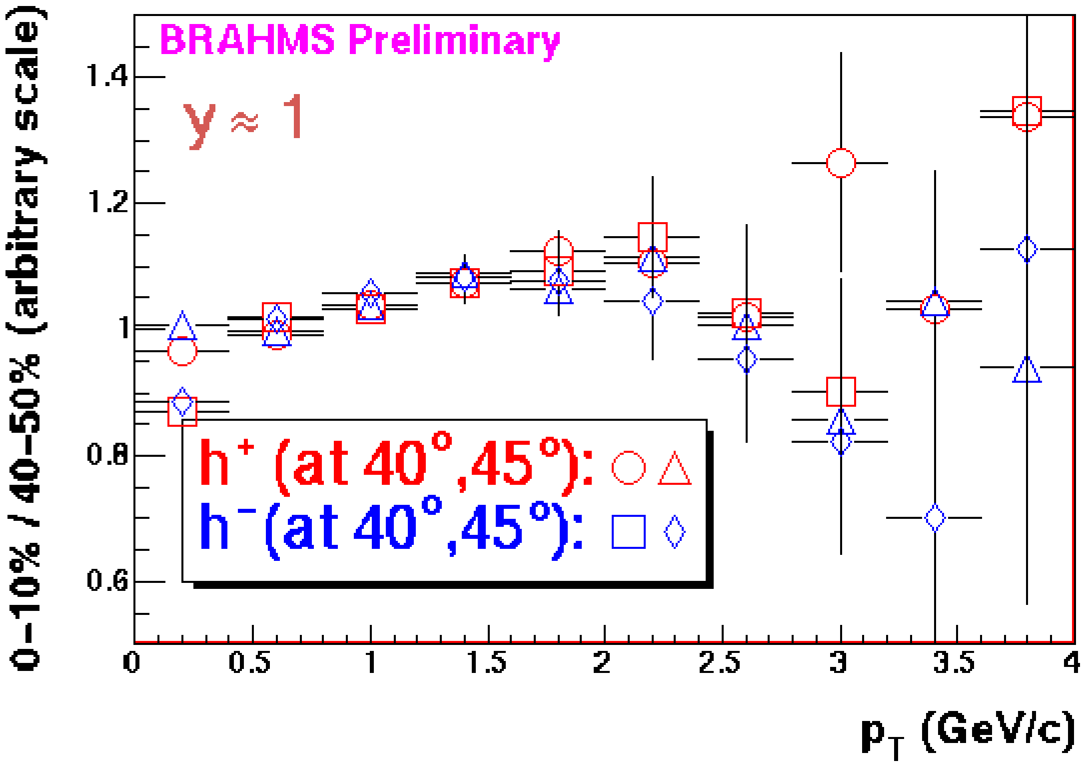


FIG. 2. Transverse momentum distributions of pions produced in a proton–gold collision computed by fragmenting gluons from conventional pQCD (dotted) and from CGC (solid) calculations. The topmost two curves are for $y = 0$ and the other pairs are for $y = 2$ and $y = 3$, respectively. The dashed line shows the suggested fit of the pion distribution.

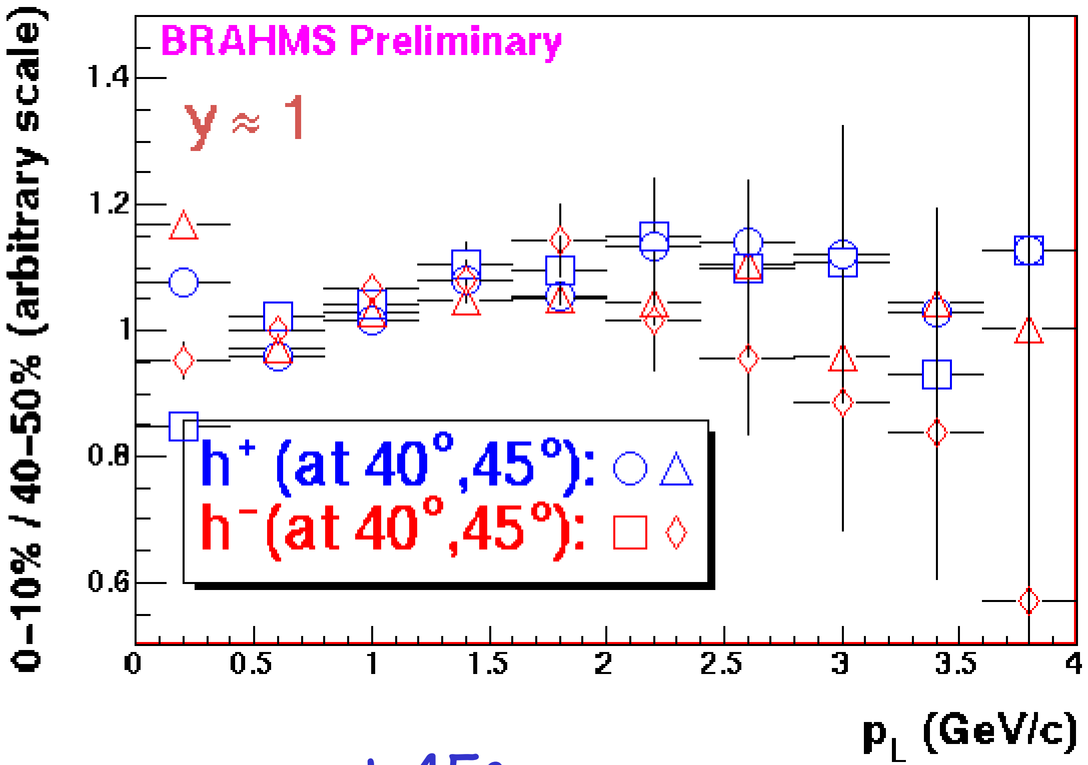
BRAHMS

At y~1 (Mid-Rapidity Spectrometer at 40,45 degrees)



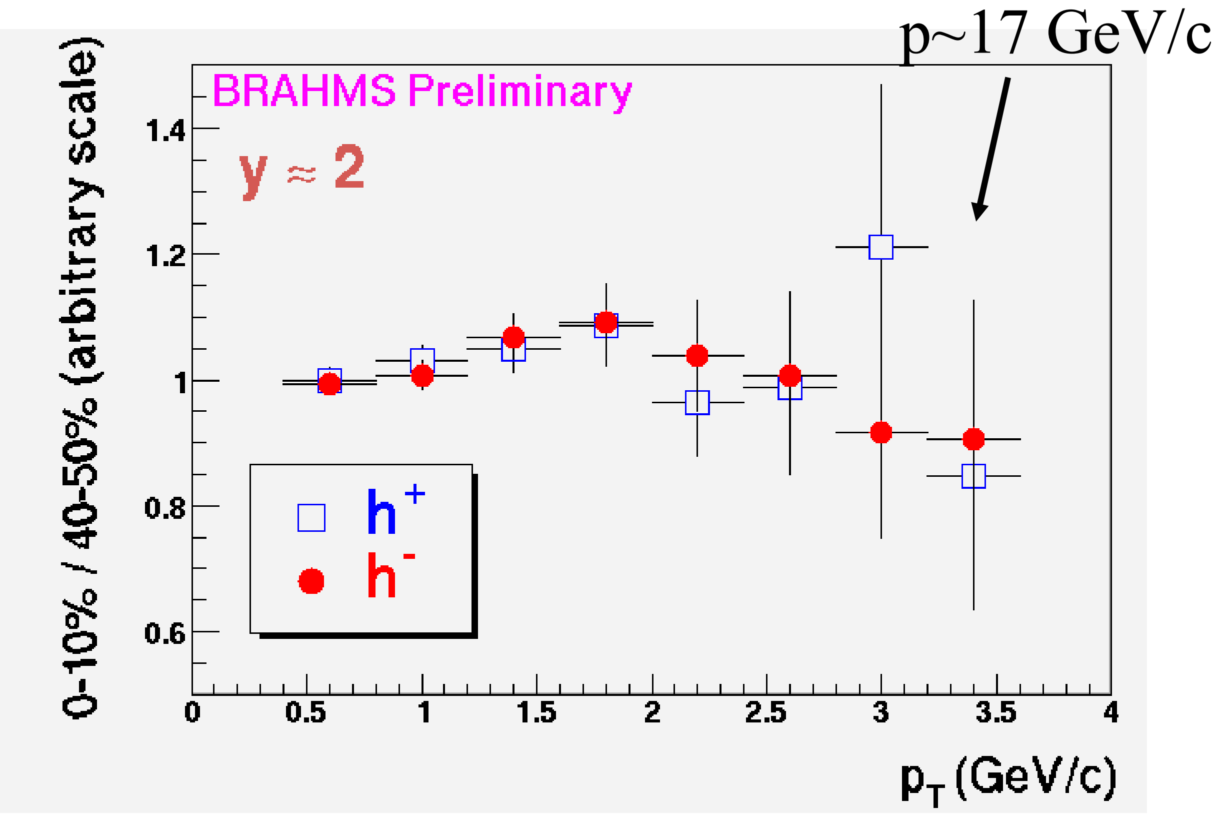
- Normalization: N_{trk}(Central)/N_{trk}(Peripheral) =1
- No difference between h^{+} and h^{-}

How About p_L at y~1 ?



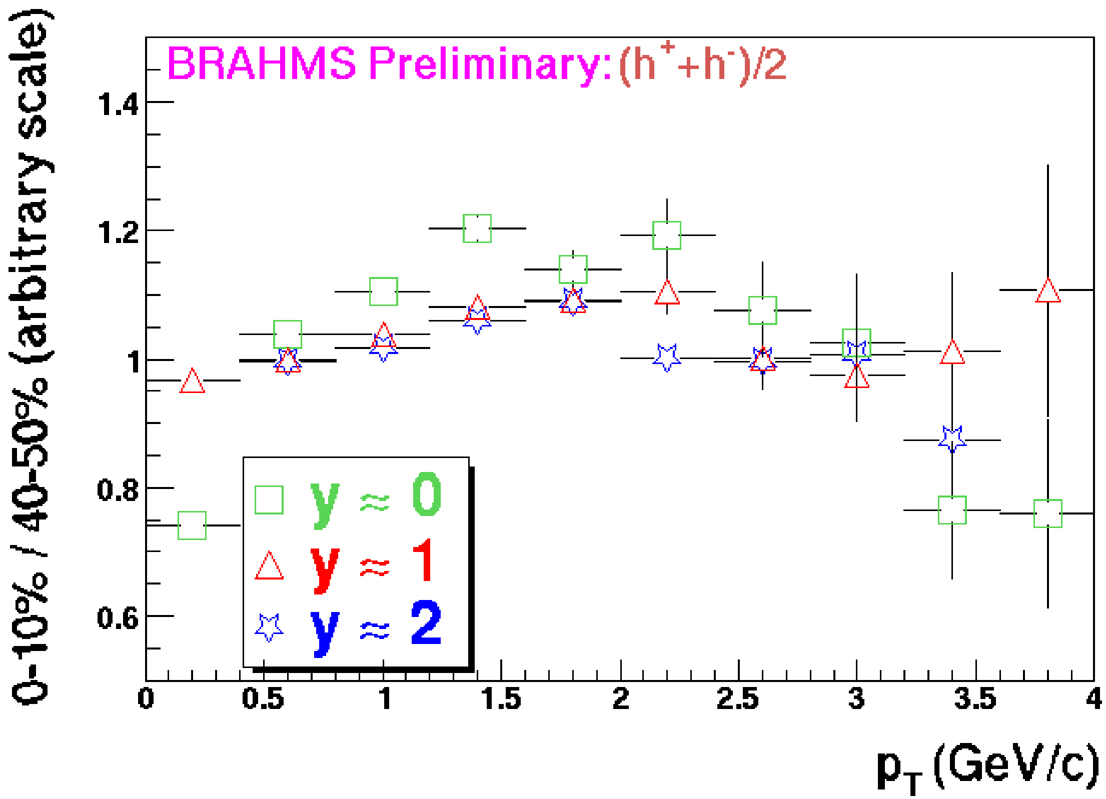
- $p_T = p_L$ at 45°
- $R(p_T) = R(p_L)$?

y ~ 2 (Forward Spectrometer at 12 degree)



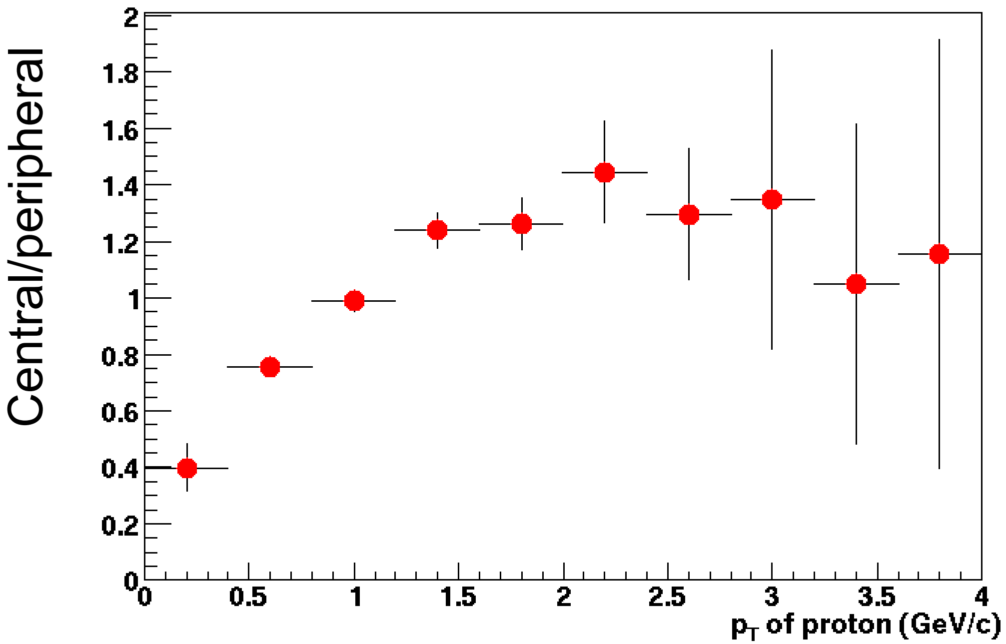
BRAHMS

Rapidity Dependent High-pt Suppressions?



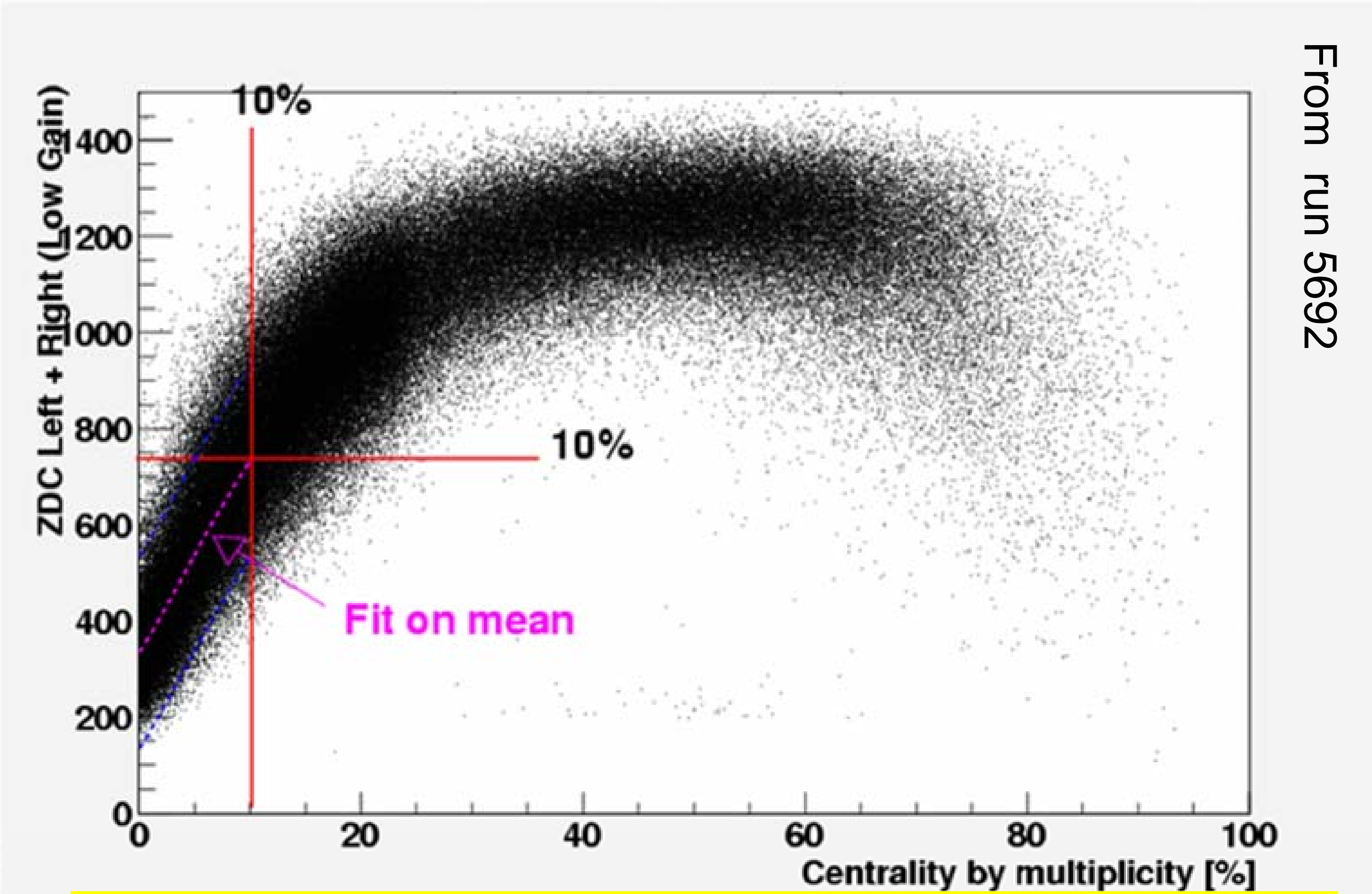
- High-p_T suppressed at $0 < y < 2$
- Systematic Error ~ 15 - 25%
- No significant rapidity-dependence within systematics

High-pt p+pbar suppression(?)



- pt ratio of Central/peripheral for p+pbar
- Normalization: N(central)/N(periperal)=1
- p and pbar: "0.88"<m2<2.0 to exclude kaons at high p
- Central: 0-10%
- Peripheral: <40% +ZDC Sum<1200
- High-pt over 2 GeV/c: Flat-to-suppressed
- Need more statistics at peripheral

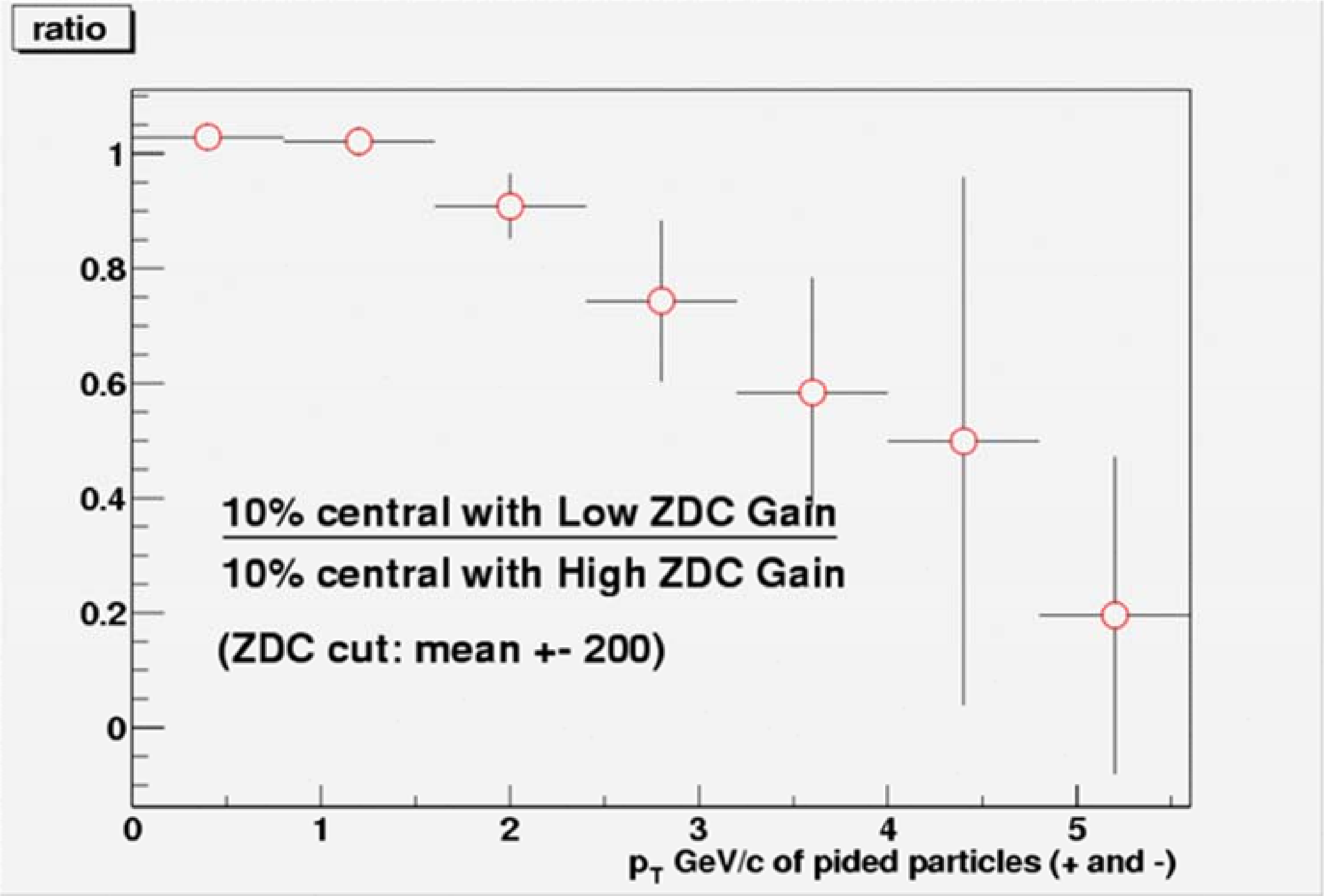
Multiplicity vs ZDC



From run 5692

- At central (high mutiplicity): ZDC dependence
- Separation 400: ~ 8 neutrons?
- ZDC more sensitive to Npart for “central” events?

High-pt vs Multiplicity/ZDC



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